After school work in Mexico: competing for children's time success

W. Kandel *, D. Post

USDA, Enconomic Research Service, 1800 M Street NW Room S2056, Washington, DC 20036, USA

1. Introduction

In recent decades, Mexico and other developing countries have enacted labor, education, and child welfare policies to shift working children out of the labor force and into the school system. Such policies take three principle forms: prohibiting certain work by children; increasing the minimum working age; and, extending compulsory schooling. Yet, child labor persists in many countries despite all these policies (International Labour Organization, 1999), and in Mexico it invariably appears within public debates about the impact of economic crisis and structural adjustment (La Jornada, 1999). By this and other accounts, as many as five million Mexican children under age 15 work for pay. As an indicator of the seriousness with which Mexico views child labor, the government recently initiated a massive scholarship program, PROGRESA, targeted at the least developed regions of the country. It provides direct payments—as a substitute for lost wages—to the families of children attending secondary school.

In this paper we discuss one important outcome overlooked in the ensuing debate over policy effectiveness: consequences for children's learning and school achievement. Extending obligatory schooling prior to eliminating child labor increases the number of children who combine schooling with part-time labor. Policy makers implicitly assume that children's work will not harm their school progress. They therefore concentrate on getting working children to attend school, with less concern about their progress and achievement once enrolled. Yet, mandatory schooling cannot resolve the inherent conflict between parents' desire to invest in children's education and their need for household labor resources (Selby et al., 1990).

While some countries ameliorate negative impacts of compulsory education through welfare programs (e.g. PROGRESA), no nation has eliminated child labor, despite social norms and public laws. A review of the data from the Third International Math and Science Study (TIMSS) indicates that for all 41 participating countries, between 5 and 63% of all surveyed students reported some degree of paid employment during the school week. Within this sample, a higher percentage of students from developing countries reported employment. Missing from policy discussions is empirical support for the assumption that working children who attend school will succeed in school.

Our paper can address this gap. In this analysis we examine the relationship between paid and unpaid labor and academic achievement by Mexican children who attend school in the state of

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* Corresponding author.
   E-mail addresses: wkandel@ers.usda.gov (W. Kandel), post@pop.psu.edu (D. Post).

Zacatecas. We complement descriptive data at the state and national level with micro-level analyses that utilize a unique data set from student questionnaires. Zacatecas affords an ideal setting for examining the relationship between work and education outcomes because of relatively low levels of educational attainment and high levels of child labor force activity. Evaluation of labor and achievement in Mexico is particularly important in light of the recent 1993 extension of compulsory education and the consequent increase in secondary school enrollment across all Mexican states. Of particular concern for welfare policy is the impact the new obligation will have on the poorest households, which typically pool their economic resources into a labor force portfolio. We expect the economic circumstances of many families—especially following the economic crisis precipitated by the peso devaluation of 1994—do not permit them to forgo their children's time value.

2. Prior research

A voluminous literature across the social sciences and education probes the relationships between children's schooling outcomes and home environments, communities, and ethnic and cultural affiliations. Despite varied theoretical frameworks, cases, and findings, most US sociologists of education have seen the roles of "student" and "worker" as alternative and thereby conflicting roles. But this conflict is relatively recent. Prior to World War II, childhood socialization to adult roles typically included working alongside of adults (Kett, 1977), a feature that continues in many developing countries today. Child labor gradually became age-segregated, such that by the mid 1950s, James Coleman (1961) noted few apprenticeships for children of steel workers and business executives, and that "the family has little to offer the child in the way of training for his place in the community (p. 3)". Subsequent research focused on youth culture and school-related factors to explain adult outcomes (Alexander et al., 1985; Fine, 1986; Pallas, 1993). With their focus on school retention and completion, dropout prevention, and scholastic attainment, investigators have implicitly accepted as normative a life course pattern that best characterizes recent cohorts of middle class US teenagers. It is important to note that this normative pattern—education first, production second—emerged in industrialized societies with sufficient parental resources to guarantee family support without relying upon child labor.

Parallel to this historical sequence, many nations promoted compulsory public schooling as valuable not only for citizenship and the stock of educated labor, but also because schooling was the desired alternative to work-based forms of socialization. Childhood and its protection became enshrined in national constitutions as a partial responsibility of the state (Boli and Meyer, 1987; Ramirez, 1987). School reformers, labor organizations, and researchers all found common ground in their belief that the way to increase child well-being was to increase their academic success, and that the way to obtain this goal was to decrease child labor and promote schooling. Governments which actively resist this norm are viewed negatively (e.g. the case of India, cf. Weiner, 1991). Yet, despite such reform efforts, persistent and large proportions of school-aged children in most developing economies combine school with work. Consequently, the sparse research literature on this question includes few empirical studies examining effects of combining work with school on children's academic achievement. Following publication of Greenberger and Steinberg's (1986) monograph, US policy makers and researchers tended to agree that children's compensated work—though helpful for securing adult employment—was detrimental to academic achievement. This near consensus in the US may have reinforced the image in developing countries that the "ideal" student studies full time and does not work.

The reasons for this hypothesized detrimental relationship have been varied. First, because school achievement demands study time from students outside school, a zero–sum conception of children's time and energy suggests that students working part-time achieve less through their education than those who dedicate themselves full–time to their studies. Second, to the extent that children themselves have internalized a dichotomy

between work and school, their success as workers or students will lead them to perceive themselves as bound for the labor force or further education, respectively. Despite this reasoning, limited empirical evidence supports concerns by policy makers that work is incompatible with school success. In the United States Mortimer and Finch (1996), Linda McNeil (1983) and Ralph McNeal (1997) all found mixed effects of work on high school grades. Warren et al. (2001) found that the relation between the two variables is causal, but in an unexpected direction: receiving lower grades drives students into the after–school workforce. D'Amico (1984) finds that modest employment activity is associated with increased high-school completion rates, a finding he attributes to a correspondence between the personality traits promoted and rewarded by employers and those traits promoted and rewarded by teachers. Outside the US, Fuller et al. (1999) in Brazil and Binder (1997) in Mexico found that non–compensated household tasks negatively affect reading achievement scores and assorted schooling activities, respectively. In The Netherlands, Veenstra (1998) found that paid work reduces gains in achievement. In sum, the paucity of research in this area hinders predictions of how after–school work affects academic outcomes.

Before continuing, we acknowledge the relative narrow focus of our subject in light of the overall broad issue of child labor and its presence as a public policy issue for over a century. The topic has been addressed within the boundaries of many of the social sciences, particularly in the disciplines of micro and macroeconomics, economic history, and public policy studies. Some examples follow. Basu's (1999) recent overview of the economics literature surveys this broad field, providing the reader with background, ongoing policy debates, microeconomic household decision-making models, and international labor standards. Horrell and Humphries (1995) demonstrate how studies in economic history inform policy debates by providing us with historical examples of current problems. Their study of industrialization on children's work in late 19th century England, for example, indicates that in that society, industrialization not only increased the number of children working in

factories but also lowered their average ages. This kind of historical analysis is quite helpful to current debates on child labor, particularly when countries like Mexico can be viewed as progressing through what can be described as a form of industrialization. Finally, because child labor has increasingly come to the attention of policy makers, the field has become more policy oriented. Khadria's (1996) proposal for combatting child labor in India is an example of a policy solution to the endemic competition between the future value to families and society of primary schooling and the current value to the family of child labor. Khadria's creative application of fiscal policy, used successfully in other arenas to promote personal savings, effectively purchases from parents the discounted value of their child's current value as a child laborer. The instrument used is a government-backed IOU, paid upon the child's certified completion of primary school. Nevertheless, due to limitations of scope and expertise, our study is grounded within the fields of sociology and comparative education.

3. Secondary education and labor in Mexico

The situation of working students in Mexico can be better understood by examining the school system within the national historical context. The legal framework regulating child labor was established in 1917 by Article 123 of Mexico's federal constitution. Originally, special protections were provided only to minors under age 12. In 1962, however, to comply with the terms of Mexico's membership in the International Labor Organization, the constitution was revised to prohibit work by persons under age 14 and limiting work hours for persons aged 14 and 15. Despite these changes in the early 1960s, legal authorities hardly ever attempted to prohibit the practice of child labor or hold families directly accountable for their children's illegal work (Ornelas, 1995).

In theory, sanctions can be placed on employers who profit from the exploitation of children, though such sanctions are rarely applied, and no specific agency monitors conditions of working

children. The legal code merely delegitimizes the participation of children in the paid labor force. As in other developing countries, Mexican policy makers are ambivalent about stigmatizing an activity many parents consider important to the welfare and even survival of the family. Most boys who sacrifice education to work do so not in large industries or even in the formal service sector but in family-related small micro-enterprises or farm work. Their female counterparts typically provide domestic labor and child care, freeing mothers to work outside the home. In principle, mechanisms to enforce child labor laws may not be essential, because even parents unaware of the precise legal restrictions on child labor may indirectly feel the stigma attached to relying on their children for support. This stigma may increase as the result of national campaigns promoting child welfare. In practice, however, Mexico has endured several severe fiscal crises, increasing the poverty of many families (Post, 2001).

4. Trends in labor force and secondary school participation

As noted, Mexico did not require children to attend school past the primary level until 1993. Consequently, many adolescents, ages 12–15, who previously had not attended school, began to do so and to study full time without working. Therefore, to situate our study of child labor and schooling in Zacatecas within the context of Mexico's recent educational reform, we compare school enrollment as a function of adult educational attainment levels for the years 1990 and 1995. We calculate the state totals of students who began secondary school (grades 7–9) for the first time, using enrollment counts obtained from Mexico's Secretary of Public Education (SEP). For each year, we divide these beginning enrollments by the estimated population of persons age 13 in each state to create gross enrollment ratios. We then correlate these ratios with adult educational attainment levels.

Fig. 1 indicates that in 1990 and 1995, the number of children beginning secondary school as a percentage of all 13 year olds varied significantly across states. This outcome corresponds closely with regional inequality in development, indicated here by state levels of adult education. Zacatecas, with low enrollments, was typical of states where relatively few adults had completed primary school. After Mexico officially made secondary school compulsory for all children in 1993, impressive increases occurred in rates of attendance across all states. Fig. 1 shows that the proportion of Zacatecan children continuing from primary to secondary school increased from 63% in 1990 to 78% in 1995. Note also that the proportion of students enrolled in Mexico City is higher than 1.0 because of the inclusion of students from the surrounding State of Mexico who commute or permanently reside in the capital.

Mexican policy evaluation must now consider the degree to which students who combine part-time work with education succeed in the school system. To help address this question, we analyzed household survey data from Mexico's National Income and Expenditure Survey of Households (Encuesta Nacional de Ingreso-Gasto de Hogares or ENIGH). This comprehensive survey, administered in various years to representative populations of each state, allows us to estimate the proportions of children who work, attend school, or do both.

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[1] Sources: Adult schooling and the size of population are from INEGI (1992) Estados Unidos Mexicanos, Perfile Sociodemografico: XI Censo General de Población y Vivienda, 1990, Aguascalientes, Ags., Mexico: INEGI, and from INEGI (1996) Estados Unidos Mexicanos, Conteo 1995 General de Población y Vivienda, Aguascalientes, Ags., Mexico: INEGI. Numbers of students beginning (i.e. not repeating) secondary school are from Secretaría de Educación Pública (1995) *Indicadores de la educación básica*. Mexico City, Mexico: Secretaría de Educación.

[2] Note: Each square corresponds to a Mexican state, excepting for the one for Mexico City which has been indicated. The area of each square is relatively proportional to the age 13 population in each state in 1990 and in 1995. For example, the age 13 population in Zacatecas was 36,367 in 1990 and 34,112 in 1995; that of Mexico City was 170,425 in 1990 and 168,247 in 1995. The "gross enrollment ratio" is the ratio of new students who began secondary school in each year divided by the population of 13-year-olds in that year.
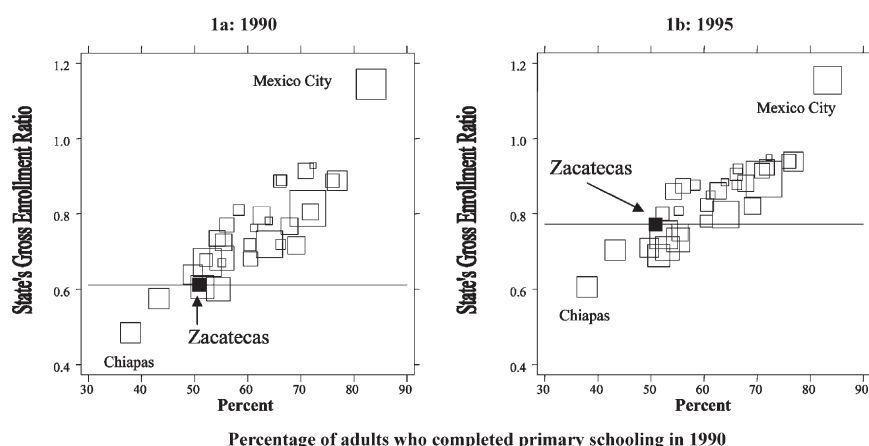
Fig. 1.   Relation of states' adult education and gross enrollment ratios for children age 13.[12]

Table 1 presents the percentage of working children in and out of school in Mexico for the years 1992, 1994, and 1996. The table shows that the number of working children from this age who attended school increased from 27 to 39%. The percentage of nonworking students increased only slightly for the nation as a whole. The data confirm, first, that increasing mandatory schooling in 1993 was associated with a moderate increase in the proportion of children attending school, and second, that a greater proportion of children attending school combined these competing activities. The latter trend is more likely the result of the Mexican economic crisis of 1994 than it is the outcome of changes in compulsory schooling, but nevertheless, children who would have previously worked full-time were now legally expected to attend school. The confluence of changes in com-

Table 1

Work and school activities of children, ages 13–15, in the state of Zacatecas and in Mexico[a]

State of Zacatecas Sample	1992			1994			1996		
	Not in school	In school	Total	Not in school	In school	Total	Not in school	In school	Total
Working in past month	79%	21%	100%	71%	29%	100%	55%	45%	100%
Count	25	6	31	19	8	26	19	15	34
Not working past month	27%	73%	100%	24%	76%	100%	32%	68%	100%
Count	24	67	91	18	58	77	19	40	59
Total	40%	60%	100%	36%	64%	100%	41%	59%	100%
	49	73	122	37	66	103	38	55	93
Mexican National Sample									
Working in past month	73%	27%	100%	67%	33%	100%	61%	39%	100%
Count	366	133	498	427	206	633	495	317	812
Not working past month	19%	81%	100%	19%	81%	100%	15%	85%	100%
Count	538	2309	2847	626	2741	3367	515	2821	3336
Total	27%	73%	100%	26%	74%	100%	24%	76%	100%
	903	2442	3345	1053	2947	4000	1010	3138	4148

[a] Sources: Analysis of 1992, 1994, and 1996 National Income-Expenditure Survey of Households. Weighted N's are used to estimate cell percentages.
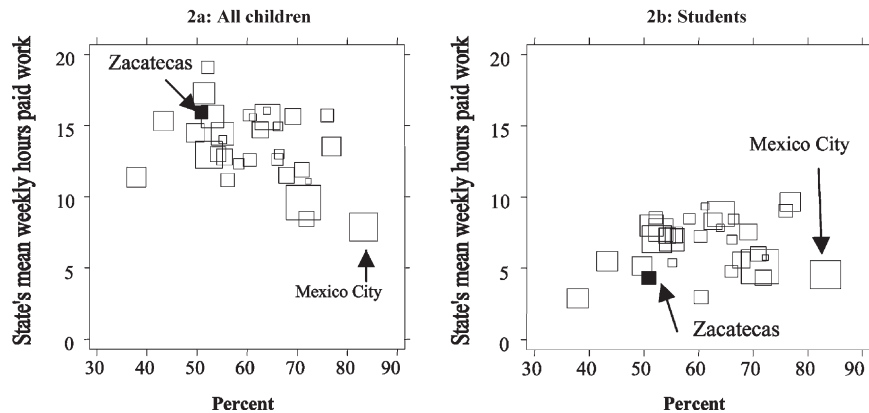
Fig. 2.   Relation of adult education and weekly hours of paid work by children and students, ages 13–15[34]

pulsory schooling with economic conditions in the mid 1990s thus provides an ideal setting for examining the impact of children's labor activity on academic outcomes. Note that for purposes of all the analyses presented, the vast majority of paid work involves personal services and unskilled manual labor and vending. Unpaid work generally involves domestic chores within the house, childcare, vending, and agricultural work.

We next compute mean hours of children's work in each state. Mean hours of work reflect both the proportions of children who work and hours worked by children employed.

In Fig. 2a, we observe pronounced regional differences in the numbers of hours worked by adolescents. These inter-state differences in mean work hours are closely associated with regional

development, as indicated again by the percentages of adults with primary schooling. Across Mexico, we can see wide inequality in the work performed by our focus population of secondary school age children. Zacatecan children work more hours than children in almost all other Mexican states, reflecting the state's relatively low level of social and economic development.

However, when we examine the work patterns of children age 13–15 *who are enrolled in school*, the relationship between work and levels of economic development disappears. Since we know from Table 1 that only 10% of these students work, it is not surprising that mean work hours are generally much lower for students age 13–15 than for all children age 13–15, including children in Zacatecas. This is evidenced by the shift of data points from the top of the graph in Fig. 2a to the bottom of the graph in Fig. 2b. What is more noteworthy in Fig. 2b is the lack of regional variation in the hours worked by students compared to those by all children. The panels in Fig. 2 indicate that children work less in states where adults have more education. However, *once children are enrolled in school*, adult education matters very little. Thus, while a state's increasing level of development may push children out of the labor force and into school, some children *combine* work with schooling. It is this population of children that may not diminish with improved economic development.

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[3] Sources: Adult schooling and the size of population are from INEGI (1992) Estados Unidos Mexicanos, Perfile Sociodemografico: XI Censo General de Población y Vivienda, 1990, Aguascalientes, Ags., Mexico: INEGI. The number of hours worked by all children and by students is estimated from INEGI (1994) Encuesta Nacional de Ingreso-Gasto de Hogares 1992, Aguascalientes, Ags., Mexico: INEGI.

[4] Note: Each square corresponds to a Mexican state, excepting for the one for Mexico City which has been indicated. The area of each square is relatively proportional to the age 13–15 population in each state in 1990. For example, the age 13–15 population in Zacatecas and Mexico City in 1990 was 108,744 and 538,194, respectively; the age 13–15 student population in 1990 was 74,685 and 478,992, respectively.

5. Conceptual framework

In the following analyses, we conceive of paid and unpaid labor force activity as mediating between individual, family, and community characteristics, and the outcome of interest, academic success. Our application of basic multivariate analysis to cross-sectional data does not allow us to explore all causal relationships between interrelated variables used in our analyses, and consequently, we cannot avoid the problem of endogeneity. The principal alternative hypothesis from this shortcoming is that our outcome variable, academic performance, could be influencing our independent variables of interest, hours spent in paid and non-paid labor. We acknowledge this limitation of our data and analyses, restrain our conclusions accordingly, and point out that practically all of the studies we cite on this topic are concerned with the same empirical question. Nevertheless, we can verify the consistency of our micro-level results with our macro-level data and what we know about child labor and education in Mexico.

The determinants of academic outcomes include household level factors such as parental educational and occupational levels, number of dependents, household structure, and wealth and individual factors such as academic aptitude, age, and sex. These factors directly influence success because individual, family, and community endowments help children overcome learning obstacles and improve schooling quality. Indirectly, these factors determine the level of possible investment in education—compared to work—when families must depend on child labor. While community level characteristics could conceivable vary enough to markedly affect education outcomes, we consider this unlikely in Zacatecas where education is a relatively homogenous service, particularly in the sites selected to be surveyed. Likewise, we expect the number of students from the same household who happen to have been in the same classroom when surveys were conducted is relatively few. We control for community level factors with variables for type of locale (rural, semi-urban, and urban) and standardize one of our outcomes—grades received for prior year's performance—by school and grade level. Our survey data from Zacatecas

enable us to examine two outcomes associated with academic success: plans to continue schooling, and school grades. Using our conceptual framework and the body of prior research relating child labor to education outcomes, we formulate two hypotheses.

Hypothesis 1. Both paid work and and unpaid help are negatively associated with aspirations to continue schooling after controlling for other factors affecting educational outcomes. We expect that greater work activity during secondary school orients children toward the labor force and away from additional schooling, particularly if their relatively higher level of participation results either from success as workers or difficulty as students.

Hypothesis 2. Work during the prior year is negatively associated with grades after controlling for other factors affecting educational outcomes. We expect that work hours are inversely related to time spent studying. Since study hours are strongly and directly correlated with students' grades, we expect a similar negative relationship if we examine months of work during the prior year in relation to grades for the prior year.

6. Survey data

Our data come from a student questionnaire administered by the first author to students in a random, stratified sample of secondary school classrooms in the Mexican state of Zacatecas. Zacatecas ranks relatively low in most measures of socioeconomic development, and paid labor force activity by children is an important factor for determining if children remain in school. Furthermore, prevalent temporary US labor migration throughout the southern portion of the state where our data was collected provides children with a route to economic mobility that often competes with additional schooling (Kandel and Kao forthcoming(a), Kandel and Kao forthcoming(b)). If anything, we would expect academic outcomes to be even more sensitive to labor force activity as a result of such a context.

Students were surveyed in schools in three distinct settings: the capital city, also named Zacatecas, with a population of 150,000, an active labor

market, and a wide variety of schooling options; the county seat of Jerez with a population of 35,000 and commercial activity supporting the agricultural production of surrounding communities; and approximately two dozen villages scattered throughout the southern more populous region of the state and ranging in population from 350 to 6000. All villages selected were within commuting distance—and the educational and occupational opportunities—of the cities of Zacatecas, Fresnillo, or the neighboring capital cities of Aguascalientes, San Luis Potosí, and Guadalajara.

Although students were initially chosen from grades 6–12, this analysis only considers outcomes for students in Mexican *secundaria* schools, the equivalent of US middle schools for grades 7–9, and the education level Mexican policy makers have targeted for intervention. Students were sampled in roughly equal proportions from the rural, semi-urban, and urban settings, and students from grade seven were slightly oversampled to reflect the increasing numbers of students leaving school at higher grades. In Zacatecas and Jerez, we selected five representative neighborhoods within each city for this study, and the schools within these neighborhoods were included in the survey of students. In the villages, we surveyed students from the schools available.

Fieldwork was conducted during the 1995-96 academic year, soon after the Mexican government devalued the peso and the precipitous financial crisis of 1994. Some recent research suggests that the impact of the financial crisis on labor markets in Zacatecas was relatively minor (Zenteno, 1999), but in any case, harsher economic conditions would only heighten the need to consider the impact of children's work on school performance.

The questionnaire asks for sociodemographic characteristics of each family member, the student's educational history; time spent in study, unpaid domestic chores, and paid employment; how the student experienced any extended absence by the father during the previous year; migration experience within the family; and educational and occupational aspirations.

Procedures for survey administration were consistently applied to ensure a uniform understanding of the survey questions. Surveys were pretested and administered with the help of two trained Mexican research assistants. Students were given an extensive introduction to the questionnaire, and classroom conditions were carefully controlled and monitored. Surveys were returned in order of completion, and each was briefly reviewed with the respondent for missing data and obviously incorrect answers.

To test response validity, the responses for a subsample of 268 student questionnaires were matched to those of corresponding Mexican Migration Project household surveys conducted during the same fieldwork period. Responses for years of education and ages for both parents were compared to each other, and from these of eight variables, differences were computed. The mean values for three distributions were less than 0.06, and the mean value of the last distribution was -0.6, due to one outlier. Standard deviations ranged from approximately 2.5 for the distribution of differences between responses for parental years of schooling to approximately 3.5 for the distribution of differences between responses for parental age. This suggests that while some variation exists in students' responses, the variation does not appear to be skewed in one direction or another. While we admittedly cannot compare students' responses for hours spent working or helping, we see no reason why responses should be be biased in either direction for these questions.

7. Methodology

Table 2 presents descriptive statistics for variables used in the three analyses which follow.

The first two dependent variables indicate whether the student worked in paid employment or unpaid help during the prior week. The third dependent variable is whether students responded affirmatively when asked if they were going to continue schooling after completing the current academic level. The fourth dependent variable is the self-reported, overall grade point average for the prior academic year. The overall grade point average is an arithmetic average of the grades received during the year for all subjects taken. Students who fail to pass two or more subjects are

Table 2
Descriptive statistics for all variables

	Mean	S.D.	Min.	Max.
DEPENDENT VARIABLES				
If respondent worked for earnings in prior week (see Table 3)	0.13	0.34	0	1
If respondent did unpaid help in prior week (see Table 3)	0.78	0.41	0	1
If respondent intends to continue schooling (see Table 4)	0.67	0.47	0	1
Standardized GPA (Zscore) for prior year (see Table 5)	0.00	0.99	−4.293	2.257
INDEPENDENT VARIABLES OF INTEREST				
Related to Prior Week (Tables 3 and 4)				
No paid labor in prior week (reference)	0.87	0.34	0	1
1-14 hours paid labor in prior week	0.06	0.24	0	1
14+ hours paid labor in prior week	0.07	0.25	0	1
No unpaid housework in prior week (reference)	0.24	0.43	0	1
1-14 hours unpaid housework in prior week	0.56	0.50	0	1
14+ hours unpaid housework in prior week	0.20	0.40	0	1
Related to Prior Year (Table 5)				
Did not work for earnings in prior year (reference)	0.78	0.41	0	1
1–3 months of paid labor during prior year	0.13	0.33	0	1
4+ months of paid labor during prior year	0.09	0.29	0	1
INDEPENDENT CONTROL VARIABLES				
Community Type				
Rural (reference)	0.35	0.48	0	1
Semi-urban	0.34	0.47	0	1
Urban	0.31	0.46	0	1
Mother's Years of Education				
0–5 years (reference)	0.28	0.45	0	1
6–8 years	0.35	0.48	0	1
9+ years	0.24	0.42	0	1
Unknown years	0.13	0.34	0	1
Father's Years of Education				
0–5 years (reference)	0.28	0.45	0	1
6–8 years	0.29	0.45	0	1
9+ years	0.27	0.44	0	1
Unknown years	0.17	0.38	0	1
Father has Professional Occupation	0.21	0.41	0	1
Family Characteristics				
Number of nonworking dependents	3.26	1.55	0	10
Single mother household	0.07	0.26	0	1
Both parents want respondent to continue studies	0.58	0.49	0	1
Individual Characteristics				
Oldest child	0.26	0.44	0	1
Age	13.55	1.16	11	17
Female	0.51	0.50	0	1
Ever repeated a grade	0.19	0.39	0	1
Number of Cases	3903			

given a failing grade for the year and must repeat the grade. In our sample, 5.4% of secondary students had failed for the year. Although the centralized school system in Mexico establishes a precise curriculum for each grade level, we control for variations in evaluation standards between schools by computing the school-specific Z-score: the student's difference from the school and grade-level mean G.P.A., divided by the standard deviation of the latter.

The independent variables of interest involve paid work and unpaid help. Students were asked how many hours they participated in each activity for each day of the prior week, as well as the number of months they engaged in paid work the prior year. We use dummy variables because of the distribution of children's work and categorize all activities into three variables: no work, modest work, and significant work. For work and help during the prior week, two hours per day comprised the cutoff between modest and significant work. For work during the prior year, four or more months of work marked the difference between modest and significant employment. We selected two hours of work or less per day as a reasonable measure of employment that does not interfere with the amount of remaining disposable time available to children for studying. We selected three or fewer months as a reasonable measure of employment that permits children to work during the summer and holiday vacation periods without interfering with their academic progress. The average values three measures of labor activity, for those working, were 16.1 hours of paid work, 9.7 hours of unpaid help, and 4.3 months of paid work.

We control for characteristics at the community, household, and individual level. Community level dummy variables control for school location in rural communities, Jerez, and Zacatecas. Consistent with much research on educational attainment, we control for mother's and father's years of schooling, including unknown levels of schooling. The latter category most likely includes many who completed six or fewer years of education; higher levels of education would be above the mean, and children would be more likely to remember them. To control for socioeconomic status acquired independently of education, we include a dummy variable for whether the father has a professional or administrative occupation. Approximately 8.1% of all respondents did not know their fathers' occupations, and we assume this group includes few professionals by applying the same reasoning used above for unknown education levels. This assumption is supported by an examination of education levels for these fathers that indicate that the vast majority have six or fewer years of schooling. Since we have no direct measures of household

wealth, we control for both the number of non-working child dependents within the family—following the resource dilution hypothesis of Blake (1989)—and whether it is headed by a single mother. Since academic orientation affects all of the outcomes considered in our analyses, we control for whether both parents want the child to continue his or her studies after completing the current academic level. Individual characteristics in the models include if the student is the oldest child, age, sex, and grade repetition as a measure of academic ability and interest.

8. Results

To begin our analysis, we estimate the likelihood that a student worked for pay or helped without pay in the prior week. The purpose of this exercise is to corroborate, at the micro-level, findings shown in Figure 1 indicating that once children were enrolled in school, any work activity was unrelated to socioeconomic characteristics.

The results for this analysis are shown in Table 3, and they support the assertion that enrolled children work for earnings independently of family background. All of the parental education variables are not significantly associated with child work in the prior year, except for the ambiguously interpretable variable of unknown schooling for the father. Moreover, the number of nonworking dependents in the household is negatively associated with the likelihood a student works or helps, a result which probably reflects the selectivity bias of the sample of students. The variables that are significant measure individual or community characteristics. These findings underscore, once again, the importance of parental and household characteristics for children's enrollment in school but not for children's work activity once enrolled.

The central question, however, is whether such labor force participation interferes with academic outcomes. We address this issue in two separate analyses, the first of which relates to what transpired in the prior week, and the second, to what transpired in the prior year. The results for the first analysis are shown in Table 4. Here, we present three models. We first regress the dependent vari-

Table 3

Logit regression predicting likelihood of paid work and unpaid help in prior week: Students grades 7–9 within selected schools in the Mexican state of Zacatecas[a]

Variables	Paid Work			Unpaid Help		
	B		SE	B		SE
Community Type						
Rural (reference)	—		—	—		—
Semi-urban	0.157		0.121	0.048		0.101
Urban	−0.269	∗	0.137	−0.151		0.105
Mother's Years of Education						
0–5 years (reference)	—		—	—		—
6–8 years	−0.155		0.131	0.122		0.107
9+ years	−0.076		0.169	0.236		0.137
Unknown years	−0.002		0.201	0.088		0.157
Father's Years of Education						
0–5 years (reference)	—		—	—		—
6–8 years	0.124		0.134	−0.134		0.112
9+ years	−0.180		0.172	0.051		0.137
Unknown years	−0.427	∗	0.193	−0.148		0.148
Father has Professional Occupation	−0.081		0.145	0.073		0.113
Family Characteristics						
Number of nonworking dependents	−0.414	∗∗	0.038	0.045		0.027
Single mother household	−0.403		0.210	−0.247		0.157
Both parents want continued studies	−0.491	∗∗	0.105	0.151		0.085
Individual Characteristics						
Oldest child	0.093		0.119	0.278	∗∗	0.098
Age	0.117	∗∗	0.046	−0.022		0.038
Female	−1.120	∗∗	0.110	1.317	∗∗	0.087
Ever repeated a grade	0.144		0.129	−0.101		0.106
Intercept	−1.425	∗	0.662	0.733		0.538
Chi Squared	2656.2	∗∗		3780.4	∗∗	
−2 Log Likelihood	354.6	∗∗		310.6	∗∗	
Number of Cases	3903			3903		

[a] ∗$p<0.05$; ∗∗$p<0.01$

able—whether the student plans to continue schooling—on the independent variables of interest to see the impact of paid work and then unpaid help. The results from the first model indicate that working more than two hours per day is negatively associated with study time. However, unpaid help is positively and significantly associated with study time. To some extent, these results reflect a gendered division of labor. Male students are more likely to work for pay and less likely to help at home than their female counterparts. Female students have 'better' education outcomes; they have higher grades and are more likely to want to con-

tinue their studies, a result found in other education studies (Mickelson, 1989). Combining these two tendencies helps produce the opposing results found in the first two models. Yet, running the models separately by gender yields similar results for both groups, albeit with lower levels of significance. Furthermore, leaving out the variables for unpaid help does not make the variable for female significant. This suggests that there may be qualities in the nature of the two types of work that are associated with different education behaviors, attitudes, or outcomes.

Nevertheless, when we control for community,

Table 4

Logit regression predicting likelihood child aspires to continue schooling: Students grades 7–9 within selected schools in the Mexican state of Zacatecas[a]

Variables	(1) B		SE	(2) B		SE	(3) B		SE
Independent Variables of Interest									
Paid Work—Prior Week									
No paid work (reference)	—		—				—		—
1–14 hours paid work	−0.144		0.138				0.072		0.156
14+ hours paid work	−0.504	**	0.131				−0.117		0.150
Unpaid Help—Prior Week									
No unpaid help (reference)				—	—		—		—
1–14 hours unpaid help				0.574	**	0.081	0.416	**	0.094
14+ hours unpaid help				0.186		0.100	0.303	**	0.115
Independent Control Variables									
Community Type									
Rural (reference)							—		—
Semi-urban							0.579	**	0.092
Urban							0.645	**	0.099
Mother's Years of Education									
0–5 years (reference)									
6–8 years							0.176		0.095
9+ years							0.743	**	0.134
Unknown years							0.142		0.147
Father's Years of Education									
0–5 years (reference)							—		—
6–8 years							0.053		0.099
9+ years							0.623	**	0.130
Unknown years							0.147		0.136
Father has Professional Occupation							0.484	**	0.117
Family Characteristics									
Number of nonworking dependents							−0.048		0.025
Single mother household							0.615	**	0.158
Both parents want continued studies							1.400	**	0.080
Individual Characteristics									
Oldest child							0.074		0.092
Age							−0.078	*	0.035
Female							−0.004		0.081
Ever repeated a grade							−0.172		0.100
Intercept	0.748	**	0.037	0.356	**	0.066	0.028		0.507
Chi Squared	4941.1	**		4901.0	**		4121.1	**	
−2 Log Likelihood	14.9	**		55.1	**		835.0	**	
Number of Cases	3903			3903			3903		

[a] *p<0.05; **p<0.01

family background, and individual characteristics, the negative impact for paid work disappears. In addition, the positive effect for unpaid help increases to include the variable for two or more hours of help per day. This result suggests that children's labor force participation has little effect on students' education outcomes, once other fac-

tors affecting education outcomes are taken into account. Moreover, even significant amounts of unpaid help are positively associated with plans to continue schooling, further supporting the previous finding that working students do not appear disadvantaged compared to nonworking students.

The control variables generally behave as

expected. Students from urban areas are more likely than rural students to plan more schooling due to their greater access to *preparatorias* (the equivalent of senior high schools) and more active labor markets. Students whose parents are more educated, whose fathers work in professional or administrative occupations, and whose parents want them to continue their studies are more likely to plan continued schooling. The positive effect for children from single mother households represents a selectivity effect; given that such children find themselves in school, they appear to be more motivated than students from intact families. Older students, who engage in more hours of paid and unpaid labor, are less likely to plan additional schooling.

In the last analysis shown on Table 5, we estimate the impact of paid work during the previous year on children's grades for the prior year. The results shown here are similar to those above. When we regress Z-scores on only the work category variables, we see that paid employment in the prior year is negatively and significantly associated with Z-scores, as expected. However, after we control for other characteristics affecting academic success, the effects of employment in the prior year disappear entirely. The control variables behave similarly to those of the prior analysis, except that grade repetition and first sibling order become significant, as we would have expected for previous analyses. The positive correlation between the number of nonworking dependents and grades reflects the selectivity of students from low SES families which we mentioned above and upon which we elaborate below.

9. Discussion

Our analysis of the determinants of grades and study for Zacatecas students leads to a reconsideration of the consequences of work for academic success. When we examine the relationship between children's paid and unpaid labor force activity and their educational plans and grades, we find, as expected, that paid labor force participation is negatively associated with both academic outcomes. While some education research indicates

that the latter can negatively impact children's grades at school (Fuller et al., 1999), we find that unpaid help is positively associated with plans for continued schooling. This result occurs despite both the relatively low range of complexity of tasks for either paid and unpaid labor as well as the greater prevalence and quantity of hours involved for unpaid help.

Yet, when we control for community, household, and individual characteristics, we find no relationship between paid child labor and academic performance. This result occurs even within separate analyses by gender and community type. Our results suggest that academic achievement is not a zero sum activity that declines in proportion with children's labor force participation. They also indicate that, at least in the Mexican case, policy makers may be justified in concerning themselves with enrollment rather than the achievement of children.

We offer several explanations for these distinct effects. First, as we stated earlier, children who help at home may be more responsible and obedient, characteristics that are helpful for performing well in school. Second, unlike children who help, children who work for pay may be shifting their orientation away from schooling toward employment and may be more likely to leave school after finishing secondary school. Third, unpaid homework may interfere less with studying. Lastly, since female students are more likely than male students to engage in unpaid help, it may be indirectly acting as a proxy for the gender associated with higher academic outcomes.

Three areas of our analysis require further development and limit the degree to which we can assuredly state our results. First, we are restricted in our ability to measure certain important characteristics that affect outcomes considered in our analyses. Administering a student survey in Mexico involves overcoming a number of technical and bureaucratic obstacles including survey length and survey question specificity, respectively. Consequently, there may exist a number of omitted variables that predict either the likelihood of working or academic achievement or both.

Second, we are limited by our use of cross-sectional data which can only measure the relationship or association between labor force activity and

Table 5

OLS regression predicting grades (Z-scores) from prior year: Students grades 7–9 within selected schools in the Mexican state of Zacatecas[a]

Variables	(1)			(2)		
	B		SE	B		SE
Independent Variables of Interest						
Paid Work—Prior Year						
No paid work (reference)	—		—	—		—
1–3 months of paid work	−0.184	∗∗	0.048	−0.059		0.047
4+ months of paid work	−0.189	∗∗	0.055	0.002		0.055
Independent Control Variables						
Community Type						
Rural (reference)				—		—
Semi-urban				−0.036		0.038
Urban				−78	∗	0.039
Mother's Years of Education						
0–5 years (reference)				—		—
6–8 years				0.035		0.040
9+ years				0.025		0.050
Unknown years				−0.122	∗	0.061
Father's Years of Education						
0–5 years (reference)				—		—
6–8 years				0.026		0.042
9+ years				0.078		0.050
Unknown years				−0.113	∗	0.057
Father has Professional Occupation				0.132	∗∗	0.041
Family Characteristics						
Number of nonworking dependents				0.023	∗	0.010
Single mother household				−0.054		0.062
Both parents want continued studies				0.150	∗∗	0.032
Individual Characteristics						
Oldest child				0.104	∗∗	0.035
Age				0.001		0.014
Female				0.238	∗∗	0.032
Ever repeated a grade				−0.459	∗∗	0.042
Intercept	0.041	∗	0.018	−0.234		0.204
Adjusted R squared	0.005			0.091		
Number of Cases	3903			3903		

[a] ∗$p<0.05$; ∗∗$p<0.01$

achievement at one point. Data covering one or more intervals would allow us greater ability to test our hypotheses. Within our sample we also have a number of biases from selectivity. Students who happen to be in school when we administered the survey are less likely to have labor force demands that cause absences. The introduction of absent cases may cause labor force participation to have a stronger negative impact on academic outcomes after controlling for other characteristics. In addition, rural students are less likely to continue attending secondary school after completing primary school. Those who do are likely to be more motivated and have higher grades than students from urban areas where schooling is more accessible. We do not expect this bias to significantly alter our results since the combination of academic selectivity with greater number of hours worked by rural students tend to cancel each other out. This conclusion was supported by results from separate models by community type.

Third, despite our framework of work and

achievement, grades may not be an accurate measure of learning. Achievement tests, which measuring cognitive functioning, may yield very different results. Grades in Mexican schools may simply indicate compensation for what instructors deem appropriate behavior, and some of these behavior—punctuality, obedience, politeness, and diligence—may in fact be learned from paid and unpaid labor force activities. Grades, therefore, may really be measuring role modeling or what otherwise has been termed "the hidden curriculum" (Dreeben, 1968). More precise measures of children's academic ability would extend this research significantly.

10. Policy implications

The United Nations' Committee on Children's Right—the branch responsible for the oversight of child labor issue—has pressured Mexico to integrate hundreds of laws and regulations on child welfare. This actually occurred this past year. Given that Mexico has integrated services and monitoring of young people, it is now imperative to continue in the line of research we have presented in order to periodically evaluate children's education enrollment and performance. Hence, our study acts as a baseline evaluation, the findings of which may not be particularly dramatic, but which provide a clear indication to policy makers about how children are faring in this new economic environment.

Opportunities for employment in Mexico have improved markedly in recent years given the passage of the North American Free Trade Agreement as well as the strength of the US economy. Mexicans of all ages and in almost all states are more likely to find employment, and those who are currently employed are more likely to find better paying work. The improved economic outlook, however, comes at a time when the Mexican government is attempting to boost school enrollments. Thus children face two sorts of pressure; the need to abide by stricter compulsory education statutes, as well as improved prospects for relatively attractive earnings. Hence, the monitoring nature of our study assumes greater impor-

tance. Given this role, education policy makers would significantly enhance their abilities to monitor and evaluate their system if standardized tests were administered at the national level.

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